

ORIGINAL

20

We claim:-

1. A process for treating metal surfaces, in which the metal surface is contacted with a formulation which comprises at least
  - (a) a polyisobutylene modified by terminal polar groups, obtainable by functionalizing reactive polyisobutylene having a number-average molecular weight  $M_n$  from 150 to 50 000,
  - (b) water or a solvent mixture containing at least 50% by weight of water, which is capable of dissolving, dispersing, suspending or emulsifying the polyisobutylene derivative, and
  - (c) optionally, further components,said polyisobutylene modified by terminal polar groups being one or more selected from the group consisting of
  - (A) linear modified polyisobutylene obtainable by functionalizing linear polyisobutylene which is reactive only at one chain end,
  - (B) linear modified polyisobutylene obtainable by functionalizing linear polyisobutylene which is reactive at both chain ends, and
  - (C) branched modified polyisobutylene obtainable by functionalizing branched polyisobutylene which is reactive at three or more chain ends,and the degree of functionalization of the chain ends is in each case at least 65%,

where, in the case (A), succinic acid radicals in which at least one carboxyl group is derivatized with polyethylene glycol substituents or with groups containing polyethylene glycol substituents and also succinic acid radicals which contain a free carboxyl group or a salt thereof and an esterified or amidated carboxyl group are excluded as terminal polar groups.

2. A process as claimed in claim 1, wherein the degree of functionalization is at least 75%.
3. A process as claimed in claim 1, wherein the degree of functionalization is at least 85%.
4. A process as claimed in any one of claims 1 to 3, wherein the reactive polyisobutylene used as starting material is prepared using  $\text{BF}_3$  as catalyst or by means of living cationic polymerization.
5. A process as claimed in any one of claims 1-4, comprising the steps of:
- (a) where appropriate, cleaning the metal surface to remove dirt, fats or oils,
  - (b) where appropriate, washing with water,
  - (c) where appropriate, pickling to remove rust and other oxides, in the absence or presence of the formulation of the invention,
  - (d) where appropriate, washing with water,
  - (e) treating the metal surface with the composition of the invention,
  - (f) where appropriate, washing with water, and
  - (g) where appropriate, aftertreating, in the absence or presence of the composition of the invention.
6. A metallic surface comprising at least one coating comprising a polyisobutylene modified by terminal polar groups and also, optionally, further components, obtainable by a process as claimed in any one of claims 1 to 4, followed by removal of the solvent.

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